



COLORADO

Department of Transportation

Region 2
Traffic and Safety Program
5615 Wills Blvd.
Pueblo, CO 81008-2349

US 285 & CR 43A Safety Project

This is written in response to questions received during the virtual public engagement event held on July 9, 2020, for the safety project at US 285 and CR 43A in Park County. This written document will address traffic related questions in hopes to promote additional understanding of the issues of having a standalone traffic signal located within a half-mile of a grade separated interchange.

The project origination is based on numerous complaints received by the Department on an annual basis inquiring why there is a traffic signal adjacent to grade separated interchange at CR 72. The traffic signal creates significant wait times during the summer months and winter events and has resulted in an increase of rear end crashes. Through those concerns we evaluated crash data to determine the benefits of removing this signal.

Utilizing grade separated interchanges provides numerous benefits and eliminates more serious injury and fatal crashes; such as, approach turns, broadsides, side swipe opposite, side swipe same and overtaking turns.

Signalized intersections also increase rear end accident frequencies that tend to result in property damage crashes. This is compounded by having a standalone signal along a high speed highway segment.

Crash Data

Within one mile in each direction of the intersection of County Road 43A, there has been 83 crashes in the time period between 6/30/14 and 6/30/19. The end date of the crash records represents the most recent crash data the State possesses and the date range covers five years.

These crashes resulted in 57 instances of property damage, 26 injury instances with 43 individuals sustaining injuries, and no fatalities.

Determining the number of rear end crashes that are a result of the traffic signal is difficult as the end of the queue created by the traffic signal changes with demand. In an effort to capture this data over this time period, an individual review of numerous police reports was undertaken to determine if rear end crashes were at the back of the queue created by the traffic signal. The majority of reports do not address queueing as a contributing factor; however, we were able to identify an additional 8 crashes with report statements that led us to believe the crashes occurred at the end of the signal queue.

Of the 83 total crashes, 75 of these happened with no inclement weather, 67 of the crashes had dry pavement and 63 of occurred during the daylight. Crash types with a higher than expected occurrences include; overturning, off road, sideswipe opposite and head on.

Having a higher than expected occurrence of these crash types indicates an intersection causing traffic turbulence. The turbulence forces quick decision making resulting in vehicles moving out of their assigned lanes. This condition causes the head on and off road type of crashes resulting in vehicles hitting embankments, fixed objects, or other vehicles in opposing travel lanes. These types of crashes are more severe in nature.

Crash Type	
Overturning:	5
Other Non Collision:	0
Pedestrians:	0
Broadside:	3
Head On:	1
Rear End:	25
Sideswipe Same:	5
Sideswipe Opposite:	2
Approach Turn:	2
Overtaking Turn:	2
Parked Motor Vehicle:	1
Railway Vehicle:	0
Bicycles:	0
Domestic Animal:	0
Wild Animal:	20
Fixed Objects:	17
Other Objects:	0
Unknown:	0
Total:	83



Removing the stopping condition created by the traffic signal at CR 43A and installing a median barrier will eliminate several existing crash types and address the higher than expected crash types through elimination or significant reduction.

Traffic Operations

The next effort undertaken was to ensure the redirected traffic will not create operational issues resulting in an increase in crash rates.

The volumes shown below represent daily volumes during 2019. Note that Deer Creek Rd is now referred to as Dellwood Dr.



Not shown on the map is Rolland Valley Dr. which has 1,361 vehicles on an average day. All traffic data was collected between the months of July and August and during the middle of the week - Tuesday through Thursday.

Utilizing Park County information pertaining to the Dispersed Rural Bailey Area, the proposed safety changes will impact a total of 5,455 homes with a vacancy rate of 26%. (2013 Area Census Area data).

Volume on CR 43A was conservatively estimated by assuming a similar number of homes existed north of Bailey, assuming two daily trips per house, and ignoring vacancy rates. The volume used was 3000 vehicles per day, with a peak hour of 300 vehicles per hour. It was further estimated that all of these vehicles are turning left out of CR 43A.

The peak trips diverted onto Delwood Dr. to get to the interchange would be less than 400 vehicles during the worst hour. The acceptable capacity of this type of road is in the range of 1000 - 1200 vehicles per day. There is enough excess capacity to create a low stress trip to get to the interchange using this route.

Merging conditions on US 285 for northbound traffic was reviewed. The US 285 north-bound AM peak hour volumes are as follows:



523 vehicles between 6 a.m. to 7a.m.
500 vehicles between 7 a.m. to 8 a.m.

The entering volume and existing northbound volume does not degrade the operations of US 285. Highway Capacity Software was utilized to determine the level of service for this merging condition. The level of service for this movement is rated as “A,” denoting “no impact” experienced by merging of highway vehicles. This report has been uploaded to the [project website](#) for reference.

Delay for Rosalie Rd was then analyzed using Highway Capacity Software. The time period selected for the analysis period is from 4 p.m. to 5 p.m. This corresponded to the highest demand on Rosalie and US 285. The report for this analysis has been uploaded to the [project website](#). The overall delay per vehicle attempting to make a left out of Rosalie during the peak period is level of service “C” denoting “minimum impact” with less than 15 seconds per vehicles waiting to find a gap to make the left turn maneuver.

Conclusion

Removal of the signal will reduce crash rates significantly along with the severity of crashes. Operations will be improved for people entering and existing onto US 285 from the interchange. The operational delay at Rosalie is shown to be acceptable and reasonable.

The changes with this project will move traffic more efficiently from the immediate area. There are other known bottle necks on US 285 that receive this traffic sooner than currently experienced. The required solutions at these known bottle neck locations are expensive and will most likely require a grade separated interchanges to address. This location has an existing grade separated interchange that is being underutilized given the close proximity of the signalized intersection that is directly contributing to an increased crash and injury rate.

